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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,911	02/22/2002	James A. Turner	57547-0424	7793

28481 7590 05/27/2004

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CHEN, PO WEI	
ART UNIT	**PAPER NUMBER**
2676	9

DATE MAILED: 05/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No. 10/080,911	Applicant(s) TURNER, JAMES A.
	Examiner Po-Wei (Dennis) Chen	Art Unit 2676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *March 9, 2004 and March 18, 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-48* is/are pending in the application.

4a) Of the above claim(s) *34-48* is/are withdrawn from consideration.

5)☒ Claim(s) *20,21 and 25-33* is/are allowed.

6)☒ Claim(s) *1-19 and 22-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

In response to Amendments received on March 9, 2004 and March 18, 2004. This action is final. Claims 1-48 are pending in this application. Claims 1, 20, 25, 28 and 34 are independent claims. The present title of the invention is "Apparatus and Method for Simulating Sensor Imagery". The Group Art Unit of the Examiner case is now 2676. Please use the proper Art Unit number to help us serve you better.

Election/Restrictions

1. Newly submitted claims 34-48 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The newly submitted claims 34-48 has a separated utility such as generating multiple video signals each including at least one screen image and different range of resolution values, classified in class 348, subclass 385.1.

Because these inventions are distinct for the reasons given above and the search required for newly submitted claims 34-48 is not required for the invention originally claimed, restriction for examination purposes as indicated is proper.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 34-48 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-13 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 5,640,468) in view of Streid (US 6,196,845).

4. Regarding claim 1, Hsu discloses a method for identifying objects and features in an image comprising:

A system for displaying a field of view representing values of a data variable (lines 42-46 of column 18, lines 1-30 of column 23 and lines 16-20 of column 25 and Fig. 6 and 9; while claim recites field of view, it is noted that the scene image represents a FLIR image and is being taken from a certain viewpoint. Also the height/depth of the object corresponds to the values of a data variable);

An image generator comprising a computer having an output and transmitting thereon a video signal comprising at least two digital data channels (lines 2-13 of column 4 and Fig. 8b; it is noted that the GIS comprises computer hardware to generate image. Also, the output video signal from the image generator is separated into 3 bands of data, see elements 122, 124 and 126 of Fig. 6 and 8b);

A display system connected with the output of the image generator and receiving said channels of digital data therefrom (lines 2-13 of column 4 and Fig. 6 and 8b; the display system Fig. 6b connects to the input image data (image being generated by input device), and receives image data from GIS processing unit which comprises the channels of data from Fig. 8b); said display system including a combiner circuit receiving and processing the channels of data (element 136 of Fig. 8b; while claim recites a combiner circuit, the term is broad enough to

include the integration processor which combines the channels of data. It is noted that a processor in computer hardware can be considered as a circuit. Also, the output base and the processing components can be considered as a display system);

Display system further having a visual display device connected with the combiner circuit and displaying video imagery derived from said video signal in a field of pixels so as to be viewable by a user (lines 1-2 of column 8 and Fig. 6 and 8b; the output base (visual display device) is connected to the GIS processing which comprises the combiner (integrate) circuit and displays the pixel-based graphical image data to user);

Digital data channels of the video signal from the image generator each comprising a plurality of bit sets each corresponding to a respective location in the field of view and having a preset number of bits of digital data therein (lines 41-49 of column 7, lines 52-56 of column 8 and lines 16-20 of column 25 and Table I; it is noted that each segment region (location) of the scene image is being represented by the bands (channels) of video data which can have different bit sets. While claim recites field of view, it is noted that the scene image can be a FLIR image, which is being generated from a viewpoint. Thus, the scene image can be considered as a field of view);

The bit sets of the first channel each representing a respective value of the data variable at a first resolution, and the bit sets of the second channel each representing a respective value of the data variable at a second resolution higher than the first resolution (lines 41-49 of column 7 and Table I; it is noted that each band (channel) of data can be assigned with different bit sets to create multi-level resolution image. Thus, a band of data will represent a resolution either higher or lower than the other bands of data depending on the bit sets values).

Hsu does not disclose simulated data variable. Streid discloses a method for stimulating night vision goggles utilizing the simulated data (line 66 of column 4 to line 31 of column 5 and lines 40-54 of column 6; aircraft position and attitude parameters generated by simulation model corresponds to simulated data variable). It would have been obvious to substitute the simulated data variable of Streid for the data variable of Hsu because Streid teaches that by utilizing the data variable will provide a realistic simulation of training system such as a flight simulation system (lines 11-27 of column 5).

5. Regarding claim 2, Hsu discloses a method for identifying objects and features in an image comprising:

The video signal comprises three digital data channels, and the third digital data channel comprises a plurality of bit sets each corresponding to a respective location in the field of view and having a preset number of bits of digital data therein; the bit sets of the third channel each representing a respective value of the data variable at a third resolution that is higher than both said first and second resolutions (lines 41-49 of column 7, Table I and Fig. 8b; it is noted that each of the 3 bands (channel) of data can be assigned with different bit sets to create multi-level resolution image. Thus, a band of data will represent a resolution either higher or lower than the other bands of data depending on the bit sets values).

6. Regarding claim 3, Hsu discloses a method for identifying objects and features in an image comprising:

The three channels are the red, green and blue data channels of a video output of the image generator (lines 41-49 of column 7 and Fig. 8b).

7. Regarding claim 4, Hsu discloses a method for identifying objects and features in an image comprising:

The resolution of each channel is determined by a respective range of corresponding values of the data variable being displayed (lines 34-51 of column 6, 41-49 of column 7, lines 52-56 of column 8 and lines 47-52 of column 23 and Table I; it is noted that each segment region has different values of data variable (object height or depth) and is being represented by different bit sets of the bands (channels) of data to have different resolutions.

8. Regarding claim 5, Hsu discloses a method for identifying objects and features in an image comprising:

The image generator transmits scale values defining said ranges to the display system (lines 59-67 of column 7 and lines 1-13 of column 8 and Fig. 8b; while claim recites scale values, the term is broad enough to include the compression factor which is being used to defined the bits sets to represent the ranges of values of the regions to the display system).

9. Regarding claim 6, Hsu discloses a method for identifying objects and features in an image comprising:

The image generator calculates values of the data variable for the locations of the field of view (lines 1-30 of column 23 and Fig. 6 and 8C; while claim recites image generator calculates the values, it is noted that the system which produce the image in Fig. 6 comprises the GIS processing which is used to measure the height and depth (values of data variable) of objects in an image with certain viewpoint).

10. Regarding claim 7, Hsu discloses a method for identifying objects and features in an image comprising:

After calculation of the values of the data variable, each of the values are stored in two respective data fields in computer accessible memory of the image generator, said data fields each being part of a respective area storing values of the data variable at respective resolutions, the associated value being scaled by respective scaling parameters for the respective resolutions (lines 34-39 of column 6 and Fig. 6; it is noted that objects with different edge values (values of data variable) have different corresponding resolution and the system has a data storage (element 14 of Fig. 6) for storing those values).

11. Regarding claim 8, Hsu discloses a method for identifying objects and features in an image comprising:

The image processor performs additional calculations on said stored values in the scaled form to simulate aspects of viewing of the field of view based on stored parameters defining conditions of viewing (lines 40-55 of column 6 and lines 24-30 of column 23 and Fig. 6; it is noted that the image processing further utilize the feature values of object to generate regions in an object model which is depended on viewpoint. It is also noted that the system includes a data storage (element 14 of Fig. 6) to store the data needed for image processing).

12. Regarding claim 9, Hsu discloses a method for identifying objects and features in an image comprising:

The image generator calculates values of the data variable by determining from scene data stored therein a parameter of a simulated object that is sensed through one of said locations in the field of view and determining the value of the data variable to be displayed for said location in the field of view based on said parameter (lines 6-37 of column 23 and Fig. 6 and 8b; it is noted that the system (Fig. 6; corresponds to image generator) receives sensed images

(LADAR images or FLIR images) from particular viewpoint and determines the height/depth of the object to be displayed as a simulated image of the scene of the viewpoint)

13. Regarding claim 10, Hsu discloses a method for identifying objects and features in an image comprising:

The image generator calculates the values using a mathematical model of radiance of simulated objects that are determined to be in view in the field of view (lines 55-57 of column 3, lines 27-30 of column 4, lines 38-46 of column 18 and lines 6-37 of column 23 and Fig. 6 and 8b; the system uses mathematical model to calculate object data such as height in the simulated scene images from a certain viewpoint. Also, while claim recites radiance of object, it is noted that the images are LADAR images which utilizes laser radar to sense objects to construct images. Thus, by using the mathematical model on the laser radar detected data of the object, it is functioning the same).

14. Regarding claim 11, Hsu discloses a method for identifying objects and features in an image comprising:

The locations of the field of view each correspond to a respective pixel of the display device (lines 48-51 of column 6 and lines 24-30 of column 23; each region of the model in certain viewpoint corresponds to the individual pixels of the region).

15. Regarding claim 12, Hsu discloses a method for identifying objects and features in an image comprising:

The bit sets are each a set of eight bits (lines 41-49 of column 7; it is noted that number of bits of each set can be coded. In the example, eight bits of a set is used (red:3, green:3, blue:2).

16. Regarding claim 13, Hsu discloses a method for identifying objects and features in an image comprising:

The data variable is simulated infrared sensor data generated by the image generator (lines 38-46 of column 18 and lines 6-37 of column 23 and Fig. 6; it is noted that the height data of object in the FLIR images can be considered as simulated infrared sensor data).

17. Regarding claim 15, Hsu discloses a method for identifying objects and features in an image comprising:

The bit sets are each a set of eight bits (lines 41-49 of column 7; noted that the example of bit set given is eight bits).

18. Regarding claim 16, Hsu discloses a method for identifying objects and features in an image comprising:

The combiner circuit has scale parameters for each of the channels and derives for each bit set a scaled value of the data variable (lines 41-37 of column 7 and lines 6-15 of column 23 and Table I; while claim recites combiner circuit, it is noted that the system has the component to combine the data from each channel derive compression factor (scale value) to generate composite images with data value of objects).

19. Regarding claim 17, Hsu discloses a method for identifying objects and features in an image comprising:

The scale parameters for each channel are transmitted from the image generator to the combiner circuitry with each new screen of the video signal (lines 41-67 of column 7 and Fig. 6 and 8b; while claim recites each new screen of the video signal, it is noted that the process of

Fig. 8b is for a single scene or a screen of the video signal. Thus, each new scene will go through the image process).

20. Regarding claim 18, Hsu discloses a method for identifying objects and features in an image comprising:

The scale parameters each include a value defining a size of a range of data values in the channel, or minimum and maximum values of the range (lines 6-13 of column 8 and Table I; table I shows minimum and maximum value range).

21. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 5,640,468) and Streid (US 6,196,845) as applied to claim 1 above, and further in view of Wilson et al. (US 3,742,124; refer to as Wilson herein).

22. Regarding claim 14, Hsu discloses a method for identifying objects and features in an image comprising:

Each of the channels transmits values of the data variable that are for a respective range of infra-red temperatures, the ranges each having a respective midpoint temperature, for the simulation being presented to the user (lines 35-46 of column 5 and lines 1-5 of column 8; it is noted that each color (channel values) corresponds to a wavelength intervals that correspond to a different range of temperatures using the radiation. This is also shown by Wilson (see Fig. 3). And while claim recites midpoint temperature, it is noted that any range of temperature will have a midpoint, thus each range represented by different colors will have a midpoint temperature).

The combination of Hsu and Streid does not disclose that midpoint temperatures being an ambient temperature. Wilson disclose a color infrared detecting set that utilize the method (lines 32-49 of column 4 and Fig. 3; it is noted that the ambient temperature 110 degree is midpoint of

the wavelength range). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Wilson to provide an improved infrared detecting set by using more detailed analyses of imagery (lines 64-65 of column 1 and lines 14-17 of column 2, Wilson). Also, both Hsu and Wilson are directed to method of infrared detecting and image analysis.

23. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 5,640,468) and Streid (US 6,196,845) as applied to claim 1 above, and further in view of Tanaka (US 6,154,252).

24. Regarding claim 19, Hsu discloses a method for identifying objects and features in an image comprising:

The scale parameters for different ranges of data values between the channels (lines 40-67 of column 7). The combination of Hsu and Streid does not disclose a respective offset. Tanaka discloses an image device for use as radiation detector utilizing the method (lines 18-34 of column 8). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Tanaka to provide optimum processing conditions for low and high illuminance areas (lines 47-53 of column 2, Tanaka). Also, both Hsu and Tanaka are directed to method of utilizing color signals for display radiation detected images.

25. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 5,640,468) and Streid (US 6,196,845) as applied to claim 1 above, and further in view of Warner et al. (US 6,255,650; refer to as Warner herein).

26. Regarding claims 22 and 23, Hsu discloses a method for identifying objects and features in an image comprising:

The visual display device is a monitor screen (lines 50-51 of column 7). The combination of Hsu and Streid does not disclose the display device is a head mounted display or a monochrome monitor. Warner discloses a device for extreme temperature radiometry and imaging utilizing the display devices (lines 9-14 of column 10 and Fig. 1A-B). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Warner to provide the advantage of better visualization of image by presenting background images in gray-scale and emphasize particular interest in color and also providing the user with portability to better operation of the device (lines 62-67 of column 1 and lines 14-16 of column 10, Warner).

27. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 5,640,468) and Streid (US 6,196,845) as applied to claim 1 above, and further in view of Cooper (US 3,786,269).

Regarding claim 24, the combination Hsu and Streid does not disclose a gain control simulation device adapted to be operated by the user, said gain control simulation device communicating with the display system so as to simulate therein adjustment of gain by the user. Cooper discloses a method for scanning electromagnetic radiation utilizing the method (lines 20-27 of column 10). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Cooper to provide better contrast for the display. Also, both Hsu and Cooper are directed to using infrared radiation to detect scene in interested.

Allowable Subject Matter

28. Claims 20-21 and 25-33 are allowed.

29. The following is a statement of reasons for the indication of allowable subject matter:

Regarding independent claim 20, prior art references do not anticipate or suggest the limitation "the combiner circuit compares a scaled value from each bit set in the first channel with a scale value from the bit set of the other channel that corresponds to the same location in the field of view and selects based on said comparison a value to be transmitted to the visual display device" in combination with the other claim limitations.

Regarding independent claim 25, prior art references do not anticipate or suggest the limitation "said combiner circuit selecting as a selected scaled value for the pixel the scaled value from the first channel if all three scaled values for the pixel are different, selecting as the selected scaled value for the pixel the scaled value of the second channel if the scaled value of the second channel is equal to the scaled value of the first channel but different from scaled value of the third channel, and selecting as the selected scaled value for the pixel the scaled value of the third channel if all the scaled values for the pixel are different" in combination with the other claim limitations.

Regarding independent claim 28, prior art references do not anticipate or suggest the limitation "scaling the scaled data values to a common scale that allows comparison of values from one channel to values from the other channel, selecting a value from said data values on the common scale based on an assessment of the data being less likely to have been clamped in value by a range of a channel" in combination with the other claim limitations.

Response to Arguments

30. Applicant's arguments filed March 9, 2004 and March 18, 2004 have been fully considered but they are not persuasive.

The Applicant argues reference Hsu does not teach or suggest video output of two

independent data channels at different resolutions created. The claim only recites transmitting a video signal comprising at least two digital data channels, and it is broad enough to include the composite image being generated using three bands of digital data (lines 38-54 and Fig. 8b). Furthermore, the Applicant argues reference Hsu does not teach or suggest transmission to a display system that displays imagery from the simulated video to be viewable by a user, instead, real image was used. However, this is known in the art taught by Streid. Streid discloses a method for stimulating night vision goggles utilizing the simulated data (line 66 of column 4 to line 31 of column 5 and lines 40-54 of column 6). It would have been obvious to substitute the simulated video data of Streid for the video data of Hsu because Streid teaches that by utilizing the data will provide a realistic simulation of training system such as a flight simulation system (lines 11-27 of column 5).

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nack et al. (US 5,317,689) disclose a visual simulation system for generating realistic scenes.

32. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Po-Wei (Dennis) Chen whose telephone number is (703) 305-8365. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C Bella can be reached on (703) 308-6829. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Po-Wei (Dennis) Chen
Examiner
Art Unit 2676

Po-Wei (Dennis) Chen
May 24, 2004

Matthew C. Bella

MATTHEW C. BELLA
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